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ABSTRACT

A self-administered rating scale and an observational schedule were developed to assess the beliefs and behaviors of early childhood teachers in relation to constructs derived from Piagetian cognitive developmental theory and operant learning theory. Application was made to existent Piegetian and operant model early education programs. The results indicated both measures satisfactorily differentiated among the programs in a manner consistent with theory. The instruments were then applied in 38 day care centers. The results indicate that although consistent and meaningful d fferences among teachers are found, a wide range of internal inconsistencies exists between a teacher's stated beliefs and her actual practices. (Author/CS)

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DAY CARE TEACHER BELIEFS AND TEACHING PRACTICES[1]

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During the last ten years great efforts have been made to increase the quantity and quality of early childhood education programs in the United States. Day Care has become a topic of national concern and the number of daycare facilities has increased markedly. Yet many questions concerning the process or transactions occuring within day care centers remain (Grotberg, Chapman, and Lazar, 1971). Our lack of information is the more remarkable because the analysis of process variables generally is considered an integral part of evaluation (Stake, 1970; Provus, 1969; Scriven, 1967) and quantitative descriptive studies are considered an important first step in understanding the teaching process (Rosenshine and Furst, 1973).

One factor contributing to our dirth of knowledge is the absence of appropriate and theoretically relevant measuring instruments for observing teacher/child interaction patterns within early childhood programs. A recent extensive review of the literature uncovered only twenty-six data based studies of teacher behavior published during the period 1963-1973 (Gordon and Jester, 1973). Of those, only one study by Prescott, Jones and Kritchevsky (1967) directly addressed interaction patterns within day care settings. Several recent studies have added to the day care list (Jambor, 1973; Green, Hollick, Knowles, VanderKar and Winter, 1973).

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Further, none of the measures fully meets the criteria we believe should be imposed when transaction measures are used within an evaluation framework (Stake, 1967). In addition to the usual psychometric requirements an appropriate system should:

1. have a basis in some rationale or theory appropriate to early education (i.e. there should be some a priori reason for thinking the observed behaviors are important to early childhood programs),
2. provide a means for determining the internal consistency of behaviors with each other and with the program rationale (Stake, 1967).
3. be capable of distinguishing among programs in expected ways, and
4. provide an empirical basis for demonstrating that the variables selected for observation are related to child outcomes.

A brief review of prior observational systems will help to make the point. Prescott et al. (1967) developed a category system based on the earlier observations of Reichenberg-Hackett (1962). The resulting observation procedure included such behavioral categories as teacher direction, guidance,restriction, development of verbal skills, neutral activities and non-communications. Each category was elaborated with a system of sub-categories. While useful for describing some aspects of the day care environment as it existed in the fifty centers observed, the procedure offers only limited data for assessing the appropriateness and effectiveness of the teacher behavior observed.

Jambor, (1973) extended and modified the Prescott and Jones categories to provide a more specific rationale for judging the appropriateness and consistency of teacher behavior within day care. He reorganized the behavioral categories into three broad role model headings suggested by Katz (1970); the maternal role, the therapeutic role and the instructional role. Both Katz and Jambor argue that behavior consistent with each of these roles is required to fully meet the needs of the day care child. Jambor then went on to observe the behavior of 10 nursery school and 10 day care teachers to determine the dispersion of their behavior across the three roles. While he uncovered large individual differences, he found no significant group differences between the day care and nursery school teacher groups. Both engaged in many more instructional and maternal interactions than therapeutic ones. Little relationship was found between any of the teaching roles and a variety of classroom and teacher characteristics.

Though based on practical logic and providing a means for judging the internal consistency of behaviors, Jambor's categories lack both a theoretical foundation and prescriptive power as they have been developed to date. The data produced are not immediately suggestive either for day care program improvement or for revision of training programs for day care personnel. No attempt was made to relate any of the behaviors to child outcomes.

The Teacher Practices Observation Record (TPOR) developed by Brown (1968) also was designed to assess the relation of teacher behaviors

to a standard; in this case Dewey's experimentalist position. The TPOR consists of 62 items half of which represent the experimentalist position and half do not. Soar (1970) using a modification of the TPOR for comparison among Follow-through programs factor analyzed his data and identified several major factors which identify teacher behavior with reference to program type (e.g. Bereiter-Englemann vs. British Infant School).

Although one can question the relevance of Dewey's experimentalism to the day care setting, Soar's results do suggest that programs may be readily differentiated, and that training a teacher in a particular program model tends to lead to more uniform behavior. The procedure does not, however, indicate if the uniformity is consistent with the specific rationale of the program. Soar (1970) does find that several of his behavior factors relate to pupil achievement.

An alternative direction is suggested by the research of Harvey, White, Prather and Hoffmeister (1966). These researchers were interested in assessing the relationship between a teacher's own beliefs and her classroom behavior. Using a sentence completion procedure the beliefs of 168 preschool teachers were assessed. Thirty teachers representing three different belief groups (high abstract, low abstract and high concrete) were then observed using a twenty-six dimension rating scale. The rating scale included such dimensions as anxiety, punitiveness, warmth, flexibility and so forth. The comparison of the three belief groups' ratings indicated there was a significant relationship between beliefs and the ratings of behavior. However, there is no attempt to relate the teacher's beliefs to any generic early childhood rationale,

nor is there an attempt to relate either beliefs or behavior to child outcomes.

The studies reported here constitute a preliminary attempt to further identify variables which have potential for discriminating among early childhood programs and to develop transactional measures which meet the criteria we have imposed.

Development of Measures

Theoretical Framework

The preceding literature review suggested that an appropriate point of attack for assessing the sources of differences across programs would be teacher behaviors and the belief system upon which they are based. That is, since program rationales differ, if one is to assess congruence of teacher behavior with the program rationale rather than some external standard, then the rationale (beliefs) need to be measured as well as the behavior. Further, if the variables isolated for study are to have potential impact of the children enrolled, it was felt that they should be derived from the applications of developmental theory-theory relevant for early childhood program development.

The theories of Piaget and Skinner are vastly different but both have contributed in a major way to the development of early childhood programs during the past ten years. Both have been cited extensively in the early childhood literature and have been given a place in the rationale for most, if not all, recent early childhood program developments. For this reason they were selected as the basis for instrument development.

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TABLE 1

THEORETICAL ASSUMPTIONS OF TWO THEORIES

	Piaget's Theory	Operant Theory
Children	*1. Active	1. Passive
	*2. Qualitatively unlike adults	2. Qualitatively like adults (adult miniatures)
Development	3. Qualitative	3. Quantitative
	4. Interaction between child and environment	4. External environment
Learning	*5. Intrinsic motivation	5. Extrinsic motivation
	6. Based on sensory education	6. Based on language overt and covert verbal labeling
	7. Stage dependent	7. Knowledge and familiarity with task or tasks similar to it
	*8. Based on massive general type of experience	8. Based on specific training
	*9. Process approach	9. Product approach
	10. Irreversible (invariant	10. Reversible

*Dimensions retained in final instruments.

Piagetian and Operant theory formulate different assumptions about children, development and learning (DeVries, 1974). A careful review of the literature related to each suggested ten dimensions of potential value in that the applications derived from the two theories were quite different (Verma, 1973) (See Table 1), and belief statements and observable behavior categories could be generated from each. Five of the dimensions were selected for study based on an estimate of their importance to the theory and the practicality of their use. A number of belief statements and behavior categories were generated for each dimension using items from Stern and Gordon (1967) and from Brown (1968) whenever possible.

Insert Table 1 about here

Teacher Belief Rating Scale

A preliminary version of the Teacher Belief Rating Scale (TBRS) was developed by converting the 6 items generated from each of the five selected dimensions to a Likert-type scale. Piagetian and Operant items were randomly ordered and rating order was reversed intermittantly to avoid the formulation of response sets. Two scores per respondent were attained by summing Operant and Piagetian items separately (with appropriate reversals.

The scales were then submitted to the program consultant or subject matter specialist, the head teacher and the assisting teacher of the Piagetian and Operant based laboratory early education programs of

TABLE 2

MEANS OF TWO SCALES OF TEACHER BELIEF RATING SCALE

FOR PIAGETIAN AND OPERANT GROUPS

	Piagetian Group (N = 3)	Operant Group (N = 3)
Piaget Scale	62.67	48.67
Operant Scale	32.67	53.0

TABLE 3

MEANS OF TWO SCALES OF TEACHER BELIEF RATING SCALE

FOR THREE GROUPS OF EARLY CHILDHOOD PERSONNEL

Group	Piaget Scale	Operant Scale
Piagetian Experts (N=3)*	60.6	31.6
Operant Experts (N=3)*	42.0	46.0
Others (N=5)	56.8	37.8

*One person from each of these groups also took part in a prior pilot study.

the University. As such these two groups (N=3 per group) were known to differ on the basic constructs being measured. The data provided by this pilot concurrent validity effort are found on Table 2.

Insert Table 2 about here

Analysis of variance revealed the effects of scale to be significant ($F=20.5$; df 1,8; $p < .05$). The group by scale interaction was also significant. ($F=36.8$; df 1,8; $p < .05$). The group by scale interaction was considered particularly crucial for determining whether the TBRS was performing properly.

Suggestions of the experts and of eight day care teachers concerning readaptability and applicability resulted in the deletion of six items. The final version of the TBRS therefore consisted of 24 items (12 representing operant beliefs and 12 representing Piagetian beliefs). This version was subsequently given to eleven early childhood personnel known to be affiliated with Operant, Piagetian or other programs. The mean scale scores for these groups are found in Table 3. Analysis again indicated a scale main effect ($F=19,8$; df 1,8; $p < .05$) and a scale by group interaction ($F=34.5$; df 3,8; $p < .05$).

Insert Table 3 about here.

Teacher Practices Observation Form

The Teacher Practices Observation Form (TPOF) was developed by formulating observable behavioral categories each of which correspond to the items on the belief scale. As such, the TPOF underwent a parallel development to the belief scale. The initial observation form consisted of 30 items (15 Piagetian and 15 Operant - six from each of the five dimensions). After successive trials in the University early childhood education programs, six categories were deleted and the remaining 24 were collapsed into 12 numbered items with a Piagetian, an operant, and a not observed alternative under each. Thus the observer was required to go down the list, checking one of the alternatives for each item immediately following a 15 second observation segment.

The TPOF then was used to collect data from the Piagetian and Operant laboratory early education programs using the procedures indicated above. Since the programs observed were training programs, observations were collected of the behavior of both the teachers and the student teachers. Average scores were calculated by dividing the total checks per item in each program with the total time observed. This procedure provided a rough rate measure for each of the teacher behaviors. Directionality was hypothesized on the basis of the scale from which a particular item was drawn. A sign test was used to determine if the rate of observed practices were consistent with the hypothesized outcomes. The results are presented in Table 4. Twenty of the 24 items showed differences in the predicted directions. Two items were not observed in either program and two items showed a reversal of the

TABLE 4

TEACHER PRACTICES IN PIAGETIAN AND OPERANT BASED

BEHAVIOR MODIFICATION PRE-SCHOOLS

Item No.	Average Scores		Hypothesized Difference	Direction of Difference	Sign
	Piagetian pre-school	Operant pre-school			
1.	.02	.00	p > 0	p > 0	+
2.	.16	.11	0 > p	0 < p	-
3.	.2	.02	p > 0	p > 0	+
4.	.02	.08	p > p	0 > p	+
5.	.08	.07	p > 0	p > 0	+
6.	.00	.01	0 > p	0 > p	+
7.	.04	.00	p > 0	p > 0	+
8.	.01	.00	0 > p	0 < p	-
9.	.00	.00	p > 0	p = 0	0
10.	.00	.02	0 > p	0 > p	+
11.	.12	.04	p > 0	p > 0	+
12.	.03	.18	0 > p	0 > p	+
13.	.09	.00	p > 0	p > 0	+
14.	.24	1.44	0 > p	0 > p	+
15.	.05	.00	p > 0	p > 0	+
16.	.00	.02	0 > p	0 > p	+
17.	.14	.1	p > 0	p > 0	+
18.	.00	.88	0 > p	0 > p	+
19.	.05	.00	p > 0	p > 0	+
20.	.00	.05	p > 0	0 > 0	+
21.	.08	.02	p > 0	p > 0	+

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Table 4 (Continued)

22.	.00	.11	0 > p	0 > p	+
23.	.05	.00	p > 0	p > 0	+
24.	.00	.00	0 > p	0 = p	0

N = 22

$p < .05$

TABLE 5

OBSERVED FREQUENCY OF PIAGET AND OPERANT BEHAVIOR

IN FOUR PROGRAMS

	Program Type			
Behavior	Operant	Piagetian	Responsive Environment	Day Care
Piaget Behavior	64	472	433	361
Operant Behavior	619	96	161	206

predicted direction. In general, the results indicated that the observation form is successful in differentiating the Piagetian teachers' behavior from Operant teachers' behavior even when some of the teachers are not yet fully trained.

Insert Table 4 about here

In another study being conducted within the University early education programs (Peters, Cohen & Willis, 1974), the behaviors of student teachers were observed in each of four early education programs using the TPOF. A total of 120 observations in each room was made over a two month period. The observed behaviors for each scale were summed across student teachers by program. The total observed frequency of Piagetian and Operant behaviors are presented in Table 5. These date tend to further confirm the validity of the TPOF and its ability to differentiate across early education programs.

Insert Table 5 about here

Reliability of the Measures

Reliability of TBRS. Kuder-Richardson Formula 20 internal consistency reliabilities were estimated for the TBRS utilizing data from the total study sample (N=38). Two methods were used. In method one each agreement statement (slightly agree, moderately agree, strongly agree)

were coded as '2' for each scale separately. Disagreement statements were coded as "1". The reliabilities thus calculated were .44 and .58 for the Piaget and Operant scales respectively. Total reliability for the full 24 items was .58. The intercorrelation of the two scales was .13 (non significant).

In the second method Kuder Richardson Formula 20 internal consistency reliabilities were calculated using the full 6 point scale range. In this case the reliabilities were .56 and .66 for the Piaget and Operant scales respectively. The total scale reliability was .61. The intercorrelation of the two scales was -.04 (non significant).

Reliability of TPOF. 68 observations were used to pretest the final Teacher Practice Observation Form. Two observers simultaniously observed the same teacher 68 times (Investigator made 68 observations and observer A and B made 42 and 26 observations respectively). The percentage of agreement between the observers was calculated.

The mean agreement across observers ranged from .72 to .96 and across items from .60 to 1.00. The overall mean agreement was .83.

Application to Day Care

Sample

The sample for the study consisted of 38 presently employed teachers in day care centers in Pennsylvania. The centers were selected from existing lists using the criteria that the programs should be geographically representative and have more than 15 children currently enrolled.

Procedures

Two trained observers were used in the study, each visiting approximately half the programs. During the visit the head teacher was observed between 9:30 am and 11:30 am. The observations were made during three half-hour periods with a ten minute break between them. Twenty observations were made during each half hour period using a point-sampling procedure. This yielded a total of sixty observations for each teacher. Throughout the visit the observers remained as unobtrusive as possible, though the teachers naturally knew they were being observed. After the observations were completed the teachers were requested to respond to the Teacher Belief Rating Scale.

Results

The results of the field study indicate that the scores on the belief scale and the frequencies of observed behavior were normally distributed across the sample. No clear Piagetian groups or operant groups of teachers could be discerned on the basis of either beliefs or practices. Spearman rank correlations were calculated for the total scores on Piagetian beliefs and practices, and for total operant beliefs and practices. These data indicate that only a weak relationship exists. Teachers who rank high in Piagetian beliefs also tend to rank high in Piagetian practices ($r=.30$, $p < .05$). Although a positive relationship is indicated for the correspondence of ranks on operant beliefs and

practices the results do not reach acceptable levels of significance ($r=.10$ $p > .05$). A significant negative correlation was found between the ranking of Piagetian practices and operant practices as might be expected form the nature of the construction of the observation instrument ($r=-.36$ $p < .05$).

In general the results indicate that the day care teachers agree significantly more with Piagetian beliefs ($\bar{X} = 51.9$, $sd=8.57$) than with operant beliefs ($\bar{X} = 42.1$, $sd=10.0$) ($t=4.69$, $p < .05$), but behave in ways more consistent with operant theory ($\bar{X} = 113.3$, $sd=28.9$) than with Piagetian theory ($\bar{X} = 71.7$, $sd=35.7$) ($t=5.77$ $p < .05$).

Both these findings suggest that there is little correspondence between teacher's professed beliefs and observed practices.

To adequately assess the internal consistency of each teacher's beliefs and practices simple correlation coefficients of Piagetian beliefs and practices and operant beliefs and practices were computed for each teacher. The results indicated that only two of the thirty-eight teachers had internally consistent beliefs and practices: one Piagetian and one Operant.

Discussion

It is not surprising that no clear Piagetian or Operant groups of teachers were found in operating day care programs. Little effort has been made to implement theoretically pure programs in day care. Rather, each teacher has attempted to put together her program in the way that appears

to work best for her. When the range of alternatives available in materials and methods is considered, it is not surprising that the decisions and choices are difficult to make.

Perhaps the teachers of this sample chose the operant practices more often because they involve teaching techniques which are easier to learn and take less time to implement. Other studies have suggested this might be the case (Bissell, 1971; Miller et al, 1970). Yet the choices made have lead to an unnatural split between theory and practice. Only two teachers had beliefs and practices that were internally consistent. It appears that theory is little applied as either a policy for guiding practice or as an after-the-fact explanation for practice. This results in both the loss to practice of what is so promising in theory and the loss to theory of what is learned in practice.

Conclusions

The studies reported here were designed to further identify variables which have potential for discriminating among early childhood programs and to develop transactional measures which relate theory and practice. The results of the studies conducted to date indicate that there are discernibly different implications for practice that can be derived from Piagetian theory and Operant theory. Both theories have relevance for early education and potential for the development of measures which can differentiate among program practices. From the theoretical framework provided by the theories two measures were developed - The Teacher Belief Rating Scale and the Teacher Practices Observation Form. When

applied to programs known to differ on their theoretical bases, both measures produced reliable data which differentiated among the programs in meaningful ways. When applied to the day to day operations of day care, theoretical purity in neither beliefs nor practices was found.

Our studies are not yet complete. We have not yet met our own fourth criterion. That is, the relationship between the teacher behavior variables selected for study and appropriate child outcome variables has not yet been determined. However, the progress made to date suggests that transaction or process measures for cross-program and within program evaluation can be derived by the steps we have followed. The TBRS and TBOF appear to have reliability, validity and utility in day care program analysis. The results obtained from the major field test are suggestive for both future research and for the training of day care personnel. However, the final decision as to their importance awaits empirical assessment of the relationship between these teacher variables and changes in children.

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FOOTNOTES

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